U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB80-157258

Distribution of Phytoplankton in Wyoming Lakes

(U.S.) Environmental Monitoring and Support Lab, Las Vegas, NV

Nov 79

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-600/3-79-122		PB 80 157258

4. TITLE AND SUBTITLE	5. REPORT DATE
DISTRIBUTION OF PHYTOPLANKTON IN WYOMING LAKES	December 1979
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
L.R. Williams, S.C. Hern, V.W. Lambou, F.A. Morris, M.K. Morris, and W.D. Taylor	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
Environmental Monitoring and Support Laboratory Office of Research and Development U.S. Environmental Protection Agency Las Vegas, NV 89114	1BD884
	11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
U.S. Environmental Protection Agency-Las Vegas, NV Office of Research and Development Environmental Monitoring and Support Laboratory Las Vegas, NV 89114	02-21-75 to 12-11-75
	14. SPONSORING AGENCY CODE EPA/600/07

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This is a data report presenting the species and abundance of phytoplankton in the 14 lakes sampled by the National Eutrophication Survey in the State of Wyoming. Results from the calculation of several water quality indices are also included (Nygaard's Trophic State Index, Palmer's Organic Pollution Index, and species diversity and abundance indices).

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
*aquatic microbiology lakes *phytoplankton water quality	Wyoming lake eutrophication Nygaard's trophic pollution indices Species diversity and abundance	06 C, M 08 H 13 B

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
RELEASE TO PUBLIC	UNCLASSIFIED	50
	20. SECURITY CLASS *(This page)*	22. PRICE
	UNCLASSIFIED	

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

Environmental Monitoring
and Support Laboratory
P.O. Box 15027
Las Vegas NV 89114

EPA-600/3-79-122
November 1979

Research and Development

PB80-157258

EPA

Distribution of Phytoplankton in Wyoming Lakes

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

RESEARCH REPORTING SERIES

Research reports of the Office of Research and Development, U.S. Environmental Protection Agency, have been grouped into nine series. These nine broad categories were established to facilitate further development and application of environmental technology. Elimination of traditional grouping was consciously planned to foster technology transfer and maximum interface in related fields. The nine series are:

1. Environmental Health Effects Research
2. Environmental Protection Technology
3. Ecological Research
4. Environmental Monitoring
5. Socioeconomic Environmental Studies
6. Scientific and Technical Assessment Reports (STAR)
7. Interagency Energy—Environment Research and Development
8. "Special" Reports
9. Miscellaneous Reports

This report has been assigned to the ECOLOGICAL RESEARCH series. This series describes research on the effects of pollution on humans,plant and animal species, and materials. Problems are assessed for their long-and short-term influences. Investigations include formations, transport, and pathway studies to determine the fate of pollutants and their effects. This work provided the technical basis for setting standards to minimize undesirable changes in living organisms in the aquatic, terrestrial, and atmospheric environments.

This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161

EPA-600/3-79-122
November 1979

DISTRIBUTION OF PHYTOPLANKTON IN WYOMING LAKES

by

L. R. Williams, S. C. Hern, V. W. Lambou,
F. A. Morris*, M. K. Morris*, and W. D. Taylor

Water and Land Quality Branch
Monitoring Operations Division
Environmental Monitoring and Support Laboratory
Las Vegas, Nevada 89114

*Department of Biological Sciences
University of Nevada, Las Vegas
Las Vegas, Nevada 89154

ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89114

DISCLAIMER

This report has been reviewed by the Environmental Monitoring and Support Laboratory-Las Vegas, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

Protection of the environment requires effective regulatory actions which are based on sound technical and scientific information. This information must include the quantitative description and linking of pollutant sources, transport mechanisms, interactions, and resulting effects on man and his environment. Because of the complexities involved, assessment of specific pollutants in the environment requires a total systems approach which transcends the media of air, water, and land. The Environmental Monitoring and Support Laboratory-Las Vegas contributes to the formation and enhancement of a sound monitoring data base for exposure assessment through programs designed to:

- develop and optimize systems and strategies for monitoring pollutants and their impact on the environment
- demonstrate new monitoring systems and technologies by applying them to fulfill special monitoring needs of the Agency's operating programs

This report presents the species and abundance of phytoplankton in the 14 lakes sampled by the National Eutrophication Survey in the State of Wyoming, along with results from the calculation of several commonly used biological indices of water quality and community structure. These data can be used to biologically characterize the study lakes, and as baseline data for future investigations. This report was written for use by Federal, State, and local governmental agencies concerned with water quality analysis, monitoring, and/or regulation. Private industry and individuals similarly involved with the biological aspects of water quality will find the document useful. For further information contact the Water and Land Quality Branch, Monitoring Operations Division.

George B. Morgan
Director
Environmental Monitoring and Support Laboratory
Las Vegas

CONTENTS

	Page
Foreword	iii
Introduction	1
Materials and Methods	3
Lake and Site Selection	3
Sample Preparation	3
Examination	4
Quality Control	5
Results	6
Nygaard's Trophic State Indices	6
Palmer's Organic Pollution Indices	6
Species Diversity and Abundance Indices	8
Species Occurrence and Abundance	10
Literature Cited	11
Appendix A. Phytoplankton Species list for the State of Wyoming.	12
Appendix B. Summary of Phytoplankton Data	15

INTRODUCTION

The collection and analysis of phytoplankton data were included in the National Eutrophication Survey in an effort to determine relationships between algal characteristics and trophic status of individual lakes.

During spring, summer, and fall of 1975, the Survey sampled 156 lakes in 11 States. Over 450 algal species and varieties were identified and enumerated from the 430 water samples examined.

This report presents the species and abundance of phytoplankton in the 14 lakes sampled in the State of Wyoming (Table 1). The Nygaard's Trophic State (Nygaard 1949), Palmer's Organic Pollution (Palmer 1969), and species diversity and abundance indices are also included.

TABLE 1. LAKES SAMPLED IN THE STATE OF WYOMING

STORET No.	Lake Name	County
5601	Big Sandy Reservoir	Sublette, Sweetwater
5602	Boulder Lake	Sublette
5603	Boysen Reservoir	Fremont
5604	Lake De Smet	Johnson
5605	Flaming Gorge Reservoir	Sweetwater (Dassett in Utah)
5606	Fremont Lake	Sublette
5607	Glendo Reservoir	Converse, Platt
5608	Key Hole Reservoir	Crook
5609	Ocean Lake	Fremont
5610	Seminoe Reservoir	Carbon
5611	Soda Lake	Sublette
5612	Viva Naughton Reservoir	Lincoln

(Continued)

TABLE 1. LAKES SAMPLED IN THE STATE OF WYOMING

STORET No.	Lake Name	County
5613	Woodruff Narrows Reservoir	Uinta
5614	Big Horn Lake (Yellowtail Reservoir)	Big Horn (Big Horn, Carbon in Mont.)

MATERIALS AND METHODS

LAKE AND SITE SELECTION

Lakes and reservoirs included in the Survey were selected through discussions with State water pollution agency personnel and U.S. Environmental Protection Agency Regional Offices (U.S. Environmental Protection Agency 1975). Screening and selection strongly emphasized lakes with actual or potential accelerated eutrophication problems. As a result, the selection was limited to lakes:

(1) impacted by one or more municipal sewage treatment plant outfalls either directly into the lake or by discharge to an inlet tributary within approximately 40 kilometers of the lake;

(2) 40 hectares or larger in size; and

(3) with a mean hydraulic retention time of at least 30 days.

Specific selection criteria were waived for some lakes of particular State interest.

Sampling sites for a lake were selected based on available information on lake morphometry, potential major sources of nutrient input, and on-site judgment of the field limnologist (U.S. Environmental Protection Agency 1975). Primary sampling sites were chosen to reflect the deepest portion of each major basin in a test lake. Where many basins were present selection was guided by nutrient source information on hand. At each sampling site, a depth-integrated phytoplankton sample was taken. Depth-integrated samples were uniform mixtures of water from the surface to a depth of 15 feet (4.6 meters) or from the surface to the lower limit of the photic zone representing 1 percent of the incident light, whichever was greater. If the depth at the sampling site was less than 15 feet (4.6 meters), the sample was taken from just off the bottom to the surface. Normally, a lake was sampled three times in 1 year, providing information on spring, summer, and fall conditions.

SAMPLE PREPARATION

To preserve the sample 4 milliliters (ml) of Acid-Lugol's solution (Prescott 1970) were added to each 130-ml sample from each site at the time of collection. The samples were shipped to the Environmental Monitoring and Support Laboratory, Las Vegas, Nevada, where equal volumes from each site

were mixed to form two 130-ml composite samples for a given lake. One composite sample was put into storage and the other was used for the examination.

Prior to examination, the composite samples were concentrated by the settling method. Solids were allowed to settle for at least 24 hours prior to siphoning off the supernate. The volume of the removed supernate and the volume of the remaining concentrate were measured and concentrations determined. A small (8-ml) library subsample of the concentrate was then taken. The remaining concentrate was gently agitated to resuspend the plankton and poured into a capped, graduated test tube. If a preliminary examination of a sample indicated the need for a more concentrated sample, the contents of the test tube were further concentrated by repeating the settling method. Final concentrations varied from 15 to 40 times the original.

Permanent slides were prepared from concentrated samples after analysis was complete. A ring of clear Karo® corn syrup with phenol (a few crystals of phenol were added to each 100 ml of syrup) was placed on a glass slide. A drop of superconcentrate from the bottom of the test tube was placed in the ring. This solution was thoroughly mixed and topped with a coverglass. After the syrup at the edges of the coverglass had hardened, the excess was scraped away and the mount was sealed with clear fingernail polish. Permanent diatom slides were prepared by drying sample material on a coverglass, heating in a muffle furnace at 400° C for 45 minutes, and mounting in Hyrax®. Finally, the mounts were sealed with clear fingernail polish.

Backup samples, library samples, permanent sample slides, and Hyrax-mounted diatom slides are being stored and maintained at the Environmental Monitoring and Support Laboratory-Las Vegas.

EXAMINATION

The phytoplankton samples were examined with the aid of binocular compound microscopes. A preliminary examination was performed to precisely identify and list all forms encountered. The length of this examination varied depending on the complexity of the sample. An attempt was made to find and identify all of the forms present in each sample. Often forms were observed which could not be identified to species or to genus. Abbreviated descriptions were used to keep a record of these forms (e.g., lunate cell, blue-green filament, Navicula #1). Diatom slides were examined using a standard light microscope. If greater resolution was essential to accurately identify the diatoms, a phase-contrast microscope was used.

After the species list was compiled, phytoplankton were enumerated using a Neubauer Counting Chamber with a 40X objective lens and a 10X ocular lens. All forms within each field were counted. The count was continued until a minimum of 100 fields had been viewed, or until the dominant form had been observed a minimum of 100 times.

®Registered trademark

QUALITY CONTROL

Project phycologists performed internal quality control intercomparisons regularly on 7 percent of the species identification and counts. Although an individual had primary responsibility for analyzing a sample, taxonomic problems were discussed among the phycologists.

Additional quality control checks were performed on the Survey samples by Dr. G. W. Prescott of the University of Montana at the rate of 5 percent. Quality control checks were made on 75 percent of these samples to verify species identifications while checks were made on the remaining 25 percent of the samples to verify genus counts. Presently, the agreement between quality control checks for species identification and genus enumerations is satisfactory.

RESULTS

A phytoplankton species list for the State is presented in Appendix A. Appendix B summarizes all of the phytoplankton data collected from the State by the Survey. The latter is organized by lake, and includes an alphabetical phytoplankton species list with concentrations for individual species given by sampling date. Results from the application of several indices are presented (Nygaard's Trophic State, Palmer's Organic Pollution, and species diversity and abundance). Each lake has been assigned a four-digit STORET number. (STORET (STOrage and RETrieval) is the U.S. Environmental Protection Agency's computer system which processes and maintains water quality data.) The first two digits of the STORET number identify the State; the last two digits identify the lake.

NYGAARD'S TROPHIC STATE INDICES

Five indices devised by Nygaard (1949) were proposed under the assumption that certain algal groups are indicative of levels of nutrient enrichment. These indices were calculated in order to aid in determining the surveyed lakes' trophic status. As a general rule, Cyanophyta, Euglenophyta, centric diatoms, and members of the Chlorococcales are found in waters that are eutrophic (rich in nutrients), while desmids and many pennate diatoms generally cannot tolerate high nutrient levels and so are found in oligotrophic waters (poor in nutrients).

In applying the indices to the Survey data, the number of taxa in each major group was determined from the species list for each sample. The ratios of these groups give numerical values which can be used as a biological index of water richness. The five indices and the ranges of values established for Danish lakes by Nygaard for each trophic state are presented in Table 2. The appropriate symbol, (E) eutrophic and (O) oligotrophic, follows each calculated value in the tables in Appendix B. A question mark (?) following a calculated value in these tables was entered when that value was within the range of both classifications.

PALMER'S ORGANIC POLLUTION INDICES

Palmer (1969) analyzed reports from 165 authors and developed algal pollution indices for use in rating water samples with high organic pollution. Two lists of organic-pollution-tolerant forms were prepared, one containing 20 genera, the other, 20 species (Tables 3 and 4). Each form was assigned a pollution index number ranging from 1 for moderately tolerant forms to 6 for

TABLE 2. NYGAARD'S TROPHIC STATE INDICES ADAPTED FROM HUTCHINSON (1967)

Index	Calculation	Oligotrophic	Eutrophic
Myxophycean	$\frac{\text{Myxophyceae}}{\text{Desmideae}}$	0.0-0.4	0.1-3.0
Chlorophycean	$\frac{\text{Chlorococcales}}{\text{Desmideae}}$	0.0-0.7	0.2-9.0
Diatom	$\frac{\text{Centric Diatoms}}{\text{Pennate Diatoms}}$	0.0-0.3	0.0-1.75
Euglenophyte	$\frac{\text{Euglenophyta}}{\text{Myxophyceae + Chlorococcales}}$	0.0-0.2	0.0-1.0
Compound	$\frac{\text{Myxophyceae + Chlorococcales + Centric Diatoms + Euglenophyta}}{\text{Desmideae}}$	0.0-1.0	1.2-25

TABLE 3. ALGAL GENUS POLLUTION INDEX (Palmer 1969)

Genus	Pollution Index
Anacystis	1
Ankistrodesmus	2
Chlamydomonas	4
Chlorella	3
Closterium	1
Cyclotella	1
Euglena	5
Gomphonema	1
Lepocinclis	1
Melosira	1
Micractinium	1
Navicula	3
Nitzschia	3
Oscillatoria	5
Pandorina	1
Phacus	2
Phormidium	1
Scenedesmus	4
Stigeoclonium	2
Synedra	2

TABLE 4. ALGAL SPECIES POLLUTION INDEX (Palmer 1969)

Species	Pollution Index
Ankistrodesmus falcatus	3
Arthrospira jenneri	2
Chlorella vulgaris	2
Cyclotella meneghiniana	2
Euglena gracilis	1
Euglena viridis	6
Gomphonema parvulum	1
Melosira varians	2
Navicula cryptocephala	1
Nitzschia acicularis	1
Nitzschia palea	5
Oscillatoria chlorina	2
Oscillatoria limosa	4
Oscillatoria princeps	1
Oscillatoria putrida	1
Oscillatoria tenuis	4
Pandorina morum	3
Scenedesmus quadricauda	4
Stigeoclonium tenue	3
Synedra ulna	3

extremely tolerant forms. Palmer based the index numbers on occurrence records and/or where emphasized by the authors as being especially tolerant of organic pollution.

In analyzing a water sample, any of the 20 genera or species of algae present in concentrations of 50 per milliliter or more are recorded. The pollution index numbers of the algae present are totaled, providing a genus score and a species score. Palmer determined that a score of 20 or more for either index can be taken as evidence of high organic pollution, while a score of 15 to 19 is taken as probable evidence of high organic pollution. Lower figures suggest that the organic pollution of the sample is not high, that the sample is not representative, or that some substance or factor interfering with algal persistence is present and active.

SPECIES DIVERSITY AND ABUNDANCE INDICES

"Information content" of biological samples is being used commonly by biologists as a measure of diversity. Diversity in this connection means the degree of uncertainty attached to the specific identity of any randomly selected individual. The greater the number of taxa and the more equal their proportions, the greater the uncertainty, and hence, the diversity (Pielou 1966). There are several methods of measuring diversity, e.g., the formulas given by Brillouin (1962) and Shannon and Weaver (1963). The method which is appropriate depends on the type of biological sample on hand.

Pielou (1966) classifies the types of biological samples and gives the measure of diversity appropriate for each type. The Survey phytoplankton samples are what she classifies as larger samples (collections in Pielou's terminology) from which random subsamples can be drawn. According to Pielou, the average diversity per individual (H) for these types of samples can be estimated from the Shannon-Wiener formula (Shannon and Weaver 1963):

$$H = -\sum_{i=1}^{S} P_i \log_x P_i$$

where P is the proportion of the ith taxon in the sample, which is calculated from n_i/N; n_i is the number of individuals per milliliter of the ith taxon; N is the total number of individuals per ml; and S is the total number of taxa. However, Basharin (1959) and Pielou (1966) have pointed out that H calculated from the subsample is a biased estimator of the sample H, and if this bias is to be accounted for, we must know the total number of taxa present in the sample since the magnitude of this bias depends on it.

Pielou (1966) suggests that if the number of taxa in the subsample falls only slightly short of the number in the larger sample, no appreciable error will result in considering S, estimated from the subsample, as being equal to the sample value. Even though considerable effort was made to find and identify all taxa, the Survey samples undoubtedly contain a fair number of rare phytoplankton taxa which were not encountered.

In the Shannon-Wiener formula, an increase in the number of taxa and/or an increase in the evenness of the distribution of individuals among taxa will increase the average diversity per individual from its minimal value of zero. Sager and Hasler (1969) found that the richness of taxa was of minor importance in determination of average diversity per individual for phytoplankton and they concluded that phytoplankton taxa in excess of the 10 to 15 most abundant ones have little effect on H. This was verified by our own calculations. Our counts are in number per milliliter and since logarithms to the base 2 were used in our calculations, H is expressed in units of bits per individual. When individuals of a taxon were so rare that they were not counted, a value of 1/130 per milliliter or 0.008 per milliliter was used in the calculations since at least one individual of the taxon must have been present in the collection.

A Survey sample for a given lake represents a composite of all phytoplankton collected at different sampling sites on the lake during a given sampling period. Since the number of samples (M) making up a composite is a function of both the complexity of the lake sampled and its size, it should affect the richness-of-taxa component of the diversity of our phytoplankton collections. The maximum diversity (MaxH) (i.e., when the individuals are distributed among the taxa as evenly as possible) was estimated from $\log_2 S$ (Pielou 1966), while the minimum diversity (MinH), was estimated from the formula:

$$MinH = -\frac{S-1}{N}\log_2\frac{1}{N} - \frac{N-(S-1)}{N}\log_2\frac{N-(S-1)}{N}$$

given by Zand (1976). The total diversity (D) was calculated from HN (Pielou 1966). Also given in Appendix B are L (the mean number of individuals per taxa per milliliter) and K (the number of individuals per milliliter of the most abundant taxon in the sample).

The evenness component of diversity (J) was estimated from H/MaxH (Pielou 1966). Relative evenness (RJ) was calculated from the formula:

$$RJ = \frac{H-MinH}{MaxH-MinH}$$

given by Zand (1976). Zand suggests that RJ be used as a substitute for both J and the redundancy expression given by Wilhm and Dorris (1968). As pointed out by Zand, the redundancy expression given by Wilhm and Dorris does not properly express what it is intended to show, i.e., the position of H in the range between MaxH and MinH. RJ may range from 0 to 1; being 1 for the most even samples and 0 for the least even samples.

Zand (1976) suggests that diversity indices be expressed in units of "sits", i.e., in logarithms to base S (where S is the total number of taxa in the sample) instead of in "bits", i.e., in logarithms to base 2. Zand points out that the diversity index in sits per individual is a normalized number ranging from 1 for the most evenly distributed samples to 0 for the least evenly distributed samples. Also, it can be used to compare different samples, independent of the number of taxa in each. The diversity in bits per

individual should not be used in direct comparisons involving various samples which have different numbers of taxa. Since MaxH equals log S, the expression in sits is equal to $\log_S S$, or 1. Therefore diversity in sits per individual is numerically equivalent to J, the evenness component for the Shannon-Wiener formula.

SPECIES OCCURRENCE AND ABUNDANCE

The alphabetic phytoplankton species list for each lake, presented in Appendix B, gives the concentrations of individual species by sampling date. Concentrations are in cells, colonies, or filaments (CEL, COL, FIL) per milliliter. An "X" after a species name indicates that the species identified in the preliminary examination was in such a low concentration that it did not appear in the count. A blank space indicates that the organism was not found in the sample collected on that date. Column S is used to designate the examiner's subjective opinion of the five dominant taxa in a sample, based upon relative size and concentration of the organism. The percent column (%C) presents, by abundance, the percentage composition of each taxon.

LITERATURE CITED

Basharin, G. P. 1959. On a statistical estimate for the entropy of a sequence of independent random variables, pp. 333-336. In: Theory of Probability and Its Applications (translation of "Teoriya Veroyatnosei i ee Premeneniya"). N. Artin (ed). 4. Society for Industrial and Applied Mathematics, Philadelphia.

Brillouin, L. 1962. Science and Information Theory (2nd ed.). Academic Press, New York. 351 pp.

Hutchinson, G. E. 1967. A Treatise on Limnology. II. Introduction to Lake Biology and the Limnoplankton. John Wiley and Sons, Inc., New York. 1,115 pp.

Nygaard, G. 1949. Hydrobiological studies of some Danish ponds and lakes. II. (K danske Vidensk. Selsk.) Biol. Sci. 7:293.

Palmer, C. M. 1969. A composite rating of algae tolerating organic pollution. J. Phycol. 5:78-82.

Pielou, E. C. 1966. The measurement of diversity in different types of biological collections. J. Theor. Biol. 13:131-144.

Prescott, G. W. 1970. How to Know the Freshwater Algae. William C. Brown Company, Dubuque. 348 pp.

Sager, P. E., and A. D. Hasler. 1969. Species diversity in lacustrine phytoplankton. I. The components of the index of diversity from Shannon's formula. Amer. Natur. 103(929):51-59.

Shannon, C. E., and W. Weaver. 1963. The Mathematical Theory of Communication. University of Illinois Press, Urbana. 117 pp.

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. Environmental Monitoring and Support Laboratory, Las Vegas, Nevada, and Corvallis Environmental Research Laboratory, Corvallis, Oregon. 91 pp.

Wilhm, V. L., and T. C. Dorris. 1968. Biological parameters for water quality criteria. Bio-Science. 18:477.

Zand, S. M. 1976. Indexes associated with information theory in water quality. J. Water Pollut. Contr. Fed. 48(8):2026-2031.

APPENDIX A

PHYTOPLANKTON SPECIES LIST FOR THE STATE OF WYOMING

Achnanthes
Anabaena flos-aquae
Anabaenopsis
Ankistrodesmus falcatus
Ankistrodesmus falcatus
v. *acicularis*
Aphanizomenon flos-aquae
Aphanothece clathrata
Asterionella formosa
Botryococcus braunii
Caloneis amphisbaena
Campylodiscus
Carteria
Ceratium hirundinella
Ceratium hirundinella
f. *robustum*
Chlorogonium
Chroococcus limneticus
Closterium
Cocconeis pediculus
Cocconeis placentula
Coelastrum microporum
Coelosphaerium naegelianum
Coelosphaerium pallidum
Cosmarium
Crucigenia quadrata
Crucigenia tetrapedia
Cryptomonas erosa
Cryptomonas marssonii
Cryptomoans reflexa
Cryptomonas rostrata
Cyclotella
Cymatopleura solea
Cymbella lata
Cymbella minuta
Cymbella muelleri
f. *ventricosa*
Cymbella ventricosa
Dactylococcopsis
Diatoma tenue
v. *elongatum*
Diatoma vulgare
Diatoma vulgare
v. *linearis*
Dictyosphaerium pulchellum
Dinobryon bavaricum
Dinobryon cylindricum
Dinobryon divergens
Elakatothrix gelatinosa
Elakatothrix viridis
Epithemia sorex
Eudorina elegans
Euglena
Eunotia
Fragilaria capucina
Fragilaria capucina
v. *mesolepta*
Fragilaria crotonensis
Fragilaria leptostauron
Glenodinium gymnodinium
Glenodinium gymnodinium
v. *biscutelliforme*
Gomphonema olivaceum
Gomphonema truncatum
Gomphosphaeria aponina
Gymnodinium ordinatum
Gyrosigma
Hannaea arcus
Hantzschia
Lyngbya
Melosira distans
Melosira granulata
Melosira granulata
v. *angustissima*
Melosira italica
Melosira varians
Merismopedia minima
Microcystis aeruginosa
Microcystis incerta
Navicula cuspidata
v. *ambigua*
Navicula rhynchocephala
v. *germainii*
Navicula salinarum
v. *intermedia*
Navicula tripunctata
Nitzschia longissima
v. *reversa*
Nitzschia vermicularis
Oocystis pusilla
Oscillatoria
Pandorina morum
Pascherina tetras
Pediastrum boryanum
Pediastrum duplex
v. *clathratum*
Phacus caudatus
v. *minor*
Phormidium mucicola
Pinnularia
Pleurosigma
Rhizosolenia eriensis
Rhoicosphenia curvata
Rhopalodia gibba

Scenedesmus balatonicus
Scenedesmus bicaudatus
Scenedesmus bijuga
Scenedesmus dimorphus
Scendesmus quadricauda
Scendesmus quadricauda
v. *longispina*
Schroederia judayi
Schroederia setigera
Skeletonema potamos
Sphaerocystis schroeteri
Spirulina
Staurastrum
Stephanodiscus astraea
v. *minutula*
Surirella angustata
Surirella ovata
Surirella ovata
v. *pinnata*
Synedra ulna
Tabellaria fenestrata
Tetraedron caudatum
Tetraedron minimum
v. *scrobiculatum*
Tetrastrum staurogeniaeforme

APPENDIX B. SUMMARY OF PHYTOPLANKTON DATA

This appendix was generated by computer. Because it was only possible to use upper case letters in the printout, all scientific names are printed in upper case and are not italicized.

The alphabetic phytoplankton lists include taxa without species names (e.g., EUNOTIA, EUNOTIA #1, FLAGELLATE, FLAGELLATES, MICROCYSTIS INCERTA ?, CHLOROPHYTAN COCCOID CELLED COLONY). When species determinations were not possible, symbols or descriptive phrases were used to separate taxa for enumeration purposes. Each name on a list, however, represents a unique species different from any other name on the same list, unless otherwise noted, for counting purposes.

Numbers were used to separate unidentified species of the same genus. A generic name listed alone is also a unique species. A question mark (?) is placed immediately after the portion of a name which was assigned with uncertainty. Numbered, questioned, or otherwise designated taxa were established on a lake-by-lake basis; therefore NAVICULA #2 from lake A cannot be compared to NAVICULA #2 from lake B. Pluralized categories (e.g., FLAGELLATES, CENTRIC DIATOMS, SPP.) were used for counting purposes when taxa could not be properly differentiated on the counting chamber.

LAKE NAME: BIG SANDY RES.
STORET NUMBER: 5601

NYGAARD TROPHIC STATE INDICES

DATE	05 19 75	09 02 75	10 16 75
MYXOPHYCEAN	0/0 D	02/0 E	1.00 E
CHLOROPHYCEAN	0/0 D	01/0 E	1.00 E
EUGLENOPHYTE	0/0 ?	0/03 ?	0/02 ?
DIATOM	0.17 ?	01/0 E	0/0 ?
COMPOUND	01/0 E	04/0 E	2.00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 19 75	09 02 75	10 16 75
GENUS	00	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 19 75	09 02 75	10 16 75
AVERAGE DIVERSITY	H	1.50	1.53	0.85
NUMBER OF TAXA	S	10.00	7.00	5.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.32	2.81	2.32
MINIMUM DIVERSITY	MINH	0.09	0.07	0.04
TOTAL DIVERSITY	D	1789.50	1508.58	1087.15
TOTAL NUMBER OF INDIVIDUALS/ML	N	1193.00	986.00	1279.00
EVENNESS COMPONENT	J	0.45	0.54	0.37
RELATIVE EVENNESS	RJ	0.44	0.54	0.36
MEAN NUMBER OF INDIVIDUALS/TAXA	L	119.30	140.86	255.80
NUMBER/ML OF MOST ABUNDANT TAXON	K	568.00	577.00	1050.00

LAKE NAME: BIG SANDY RES.
STORET NUMBER: 5601

CONTINUED

TAXA	FORM	08 19 75			09 02 75			10 16 75		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL				1	50,5	577			X
CENTRIC DIATOM	CEL	1	47,4	568						
CHROOMONAS ?	CEL	1	43,9	512	1	24,4	241	1	92,1	1050
CLOSTERIUM	CEL									X
CRYPTOMONAS	CEL	1	4,9	57	1	12,2	120	1	0,2	131
CYMBELLA	CEL			X						
GLENODINIUM GYMNODINIUM	CEL						X			
MICROCYSTIS AERUGINOSA	COL						X			
NAVICULA	CEL			X						
NAVICULA PSEUDOREINHARDTII ?	CEL			X						
NITZSCHIA	CEL	1	2,3	28						
PASCHERINA TETRAS	COL			X						
SCHROEDERIA JUDAYI	CEL				1	4,9	48	1	7,7	98
STEPHANODISCUS	CEL						X			
SURIRELLA ANGUSTATA	CEL			X						
SURIRELLA OVATA	CEL	1	2,3	28						
TOTAL				1193			986			1279

LAKE NAME: BOULDER LAKE
STORET NUMBER: 5602

NYGAARD TROPHIC STATE INDICES

DATE	08 28 75	10 17 75
MYXOPHYCEAN	0/0 O	2,00 E
CHLOROPHYCEAN	01/0 E	3,00 E
EUGLENOPHYTE	0/01 ?	0/05 ?
DIATOM	0/01 ?	0,17 ?
COMPOUND	01/0 E	6,00 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 28 75	10 17 75
GENUS	04	01
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 28 75	10 17 75
AVERAGE DIVERSITY	H	0,56	2,12
NUMBER OF TAXA	S	5,00	16,00
NUMBER OF SAMPLES COMPOSITED	M	3,00	3,00
MAXIMUM DIVERSITY	MAXH	2,32	4,00
MINIMUM DIVERSITY	MINH	0,01	0,50
TOTAL DIVERSITY	D	2364,32	606,32
TOTAL NUMBER OF INDIVIDUALS/ML	N	4222,00	286,00
EVENNESS COMPONENT	J	0,24	0,93
RELATIVE EVENNESS	RJ	0,24	0,47
MEAN NUMBER OF INDIVIDUALS/TAXA	L	844,40	17,88
NUMBER/ML OF MOST ABUNDANT TAXON	K	3806,00	104,00

LAKE NAME: BOULDER LAKE
STORET NUMBER: 5602

CONTINUED

TAXA	FORM	09 28 75			10 17 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL						X
APHANOTHECE ?	COL				12	27,3	78
ASTERIONELLA FORMOSA	CEL			X			X
CHLAMYDOMONAS ?	CEL	11	90,1	3806			
CHROOMONAS ?	CEL	12	7,7	327	9	9,1	26
COSMARIUM	CEL						X
CRYPTOMONAS	CEL	13	1,4	59			
CRYPTOMONAS EROSA	CEL				4	9,1	26
DINOBRION BAVARICUM	CEL						X
KLAKATOTHRIX GELATINOSA	CEL				19	18,2	52
FRAGILARIA CROTONENSIS	CEL						X
GYROSIGMA	CEL						X
MELOSIRA ITALICA	CEL						X
SCENEDESMUS BIJUGA	COL						X
SPHAEROCYSTIS SCHROETERI	COL	14	8,7	30	11	36,4	104
SURIRELLA	CEL						X
SYNEDRA ULNA	CEL						X
TABELLARIA FENESTRATA	CEL						X
TOTAL				4222			286

LAKE NAME: BOYSEN RES.
STORET NUMBER: 5603

NYGAARD TROPHIC STATE INDICES

DATE	05 19 75	09 02 75	10 17 75
MYXOPHYCEAN	01/0 E	4.00 E	02/0 E
CHLOROPHYCEAN	03/0 E	6.00 E	01/0 E
EUGLENOPHYTE	0/04 ?	0/10 ?	0/03 ?
DIATOM	0.31 E	0.14 ?	0/13 ?
COMPOUND	08/0 E	11.0 E	03/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 19 75	09 02 75	10 17 75
GENUS	03	00	05
SPECIES	00	00	03

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 19 75	09 02 75	10 17 75
AVERAGE DIVERSITY	H	1.72	1.89	2.45
NUMBER OF TAXA	S	23.00	25.00	19.00
NUMBER OF SAMPLES COMPOSITED	M	4.00	5.00	5.00
MAXIMUM DIVERSITY	MAXH	4.52	4.64	4.25
MINIMUM DIVERSITY	MINH	0.05	0.14	0.22
TOTAL DIVERSITY	D	10621.00	4131.54	2266.25
TOTAL NUMBER OF INDIVIDUALS/ML	N	6175.00	2186.00	925.00
EVENNESS COMPONENT	J	0.38	0.41	0.58
RELATIVE EVENNESS	RJ	0.38	0.39	0.56
MEAN NUMBER OF INDIVIDUALS/TAXA	L	268.48	87.44	48.68
NUMBER/ML OF MOST ABUNDANT TAXON	K	2777.00	1129.00	350.00

LAKE NAME: BOYSEN RES.
STORET NUMBER: 5603

CONTINUED

TAXA	FORM	05 19 75 %B	05 19 75 %C	05 19 75 ALGAL UNITS PER ML	09 02 75 %B	09 02 75 %C	09 02 75 ALGAL UNITS PER ML	10 17 75 %B	10 17 75 %C	10 17 75 ALGAL UNITS PER ML
ANABAENA	FIL				51	3.2	71			
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL			X						
APHANIZOMENON FLOS-AQUAE	FIL				11	51.6	1129	11	13.9	125
ASTERIONELLA FORMOSA	CEL	23	41.0	2529			X			
CENTRIC DIATOM	CEL	14	4.0	248						
CHROOMONAS ?	CEL	13	6.4	397	4	29.0	635	13	37.8	350
COCCONEIS PEDICULUS	CEL									X
CRYPTOMONAS	CEL				21	9.7	212			
CRYPTOMONAS EROSA	CEL	15	3.0	124					8.1	75
CYMATOPLEURA SOLEA	CEL			X						
CYMBELLA	CEL			X						
CYMBELLA #1	CEL									X
CYMBELLA ACUTIUSCULA ?	CEL									X
CYMBELLA LATA	CEL			X						
DIATOMA VULGARE	CEL						X	21	5.4	50
DIATOMA VULGARE V. LINEARIS	CEL						X			
DINOBRYON DIVERGENS	CEL					2.2	47			
ELAKATOTHRIX VIRIDIS	COL						X			
EPITHEMIA SOREX	CEL									X
FRAGILARIA CROTONENSIS	CEL	11	45.0	2777			X		2.7	25
GLENODINIUM GYMNODINIUM	CEL						X			X
GOMPHONEMA OLIVACEUM	CEL						X			
GOMPHONEMA TRUNCATUM	CEL			X						
GYROSIGMA ?	CEL			X						
HANNAEA ARCUS	CEL						X			
NANTESCHIA	CEL						X			X
MELOSIRA GRANULATA	CEL			X			X			
MELOSIRA VARIANS	CEL			X						
MICROCYSTIS AERUGINOSA	COL				3	1.1	23			
NAVICULA	CEL			X						
NAVICULA #1	CEL									X
NAVICULA #2	CEL									X
NAVICULA SPP.	CEL							15	24.3	225
NITESCHIA	CEL		0.8	50					2.7	25
NITESCHIA #1	CEL			X						
NITESCHIA #2	CEL			X						
NITESCHIA VERMICULARIS	CEL									
OOCYSTIS	CEL						X			
OSCILLATORIA	FIL		0.4	25						
PANDORINA MORUM	COL						X			
PEDIASTRUM DUPLEX V. CLATHRATUM	COL			X						
PHOPNICIUM MUCICOLA	COL					1.1	23			
SCENEDESMUS DIMORPHUS	COL					1.1	23			
SCENEDESMUS QUADRICAUDA	COL		0.4	25			X			
SCHROEDERIA SETIGERA	CEL					1.1	23			
SPHAEROCYSTIS SCHROETERI	COL						X			X
SPIRULINA	CEL									X
STAURASTRUM	CEL						X			
STEPHANODISCUS	CEL			X						
SURIRELLA	CEL			X						
SURIRELLA OVATA	CEL						X			
SURIRELLA OVATA V. PINNATA										
SYNEDRA ULNA	CEL			X				14	5.4	50
TOTAL				6178			2186			925

LAKE NAME: LAKE DE SMET
STORET NUMBER: 5604

NYGAARD TROPHIC STATE INDICES

DATE	05 23 75	08 24 75	10 15 75
MYXOPHYCEAN	0,50 E	4,00 E	03/0 E
CHLOROPHYCEAN	1,50 E	1,00 E	03/0 E
EUGLENOPHYTE	0/04 ?	0/05 ?	0/06 ?
DIATOM	0,75 E	1,00 E	0,50 E
COMPOUND	3,50 E	7,00 E	07/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 23 75	08 24 75	10 15 75
GENUS	00	02	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 23 75	08 24 75	10 15 75
AVERAGE DIVERSITY	H	1,63	2,74	1,52
NUMBER OF TAXA	S	19,00	15,00	13,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00	2,00
MAXIMUM DIVERSITY	MAXH	4,25	3,91	3,70
MINIMUM DIVERSITY	MINH	0,04	0,03	0,04
TOTAL DIVERSITY	D	11879,44	15302,90	5734,96
TOTAL NUMBER OF INDIVIDUALS/ML	N	7288,00	5585,00	3773,00
EVENNESS COMPONENT	J	0,38	0,70	0,41
RELATIVE EVENNESS	RJ	0,38	0,70	0,41
MEAN NUMBER OF INDIVIDUALS/TAXA	L	383,58	372,33	290,23
NUMBER/ML OF MOST ABUNDANT TAXON	K	5052,00	1749,00	2338,00

LAKE NAME: LAKE DE SMET
STORET NUMBER: 5604

CONTINUED

TAXA	FORM	05 23 75			08 24 75			10 15 75		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
ANABAENA	FIL				12	12.1	673	15	3.3	123
ANKISTRODESMUS FALCATUS	CEL			X						
APHANIZOMENON FLOS-AQUAE	FIL				11	14.4	807	11	62.0	2338
APHANOTHECE	COL			X						
ASTERIONELLA FORMOSA	CEL				15	7.2	404			
CENTRIC DIATOM	CEL	11	69.3	5052						
CERATIUM HIRUNDINELLA	CEL			X			X			
CHROOMONAS ?	CEL	1	1.1	83	1	3.6	202	12	26.1	984
CLOSTERIUM	CEL			X						
COCCONEIS PLACENTULA	CEL			X						
COELOSPHAERIUM PALLIDUM	COL				14	2.4	135			
COSMARIUM	CEL			X			X			
CRYPTOMONAS EROSA	CEL	1	0.6	41	1	1.2	67	14	4.3	164
CRYPTOMONAS MARSSONII	CEL	1	0.6	41						
CRYPTOMONAS REFLEXA	CEL							13	3.3	123
CRYPTOMONAS ROSTRATA	CEL			X						
DIATOMA TENUE V. ELONGATUM	CEL	13	5.7	414						
DICTYOSPHAERIUM PULCHELLUM	COL			X						
FLAGELLATE	CEL	1	1.7	124	1	15.7	875			
FRAGILARIA CAPUCINA	CEL	12	11.9	870						X
FRAGILARIA CROTONENSIS	CEL	14	4.0	290			X			
GYMNODINIUM ORDINATUM	CEL						X			X
MELOSIRA	CEL			X						
MELOSIRA GRANULATA	CEL				13	31.3	1749			X
MICROCYSTIS INCERTA	COL				1	12.1	673			X
NAVICULA	CEL									X
OOCYSTIS	CEL			X						
PEDIASTRUM BORYANUM	COL									X
SCHROEDERIA SETIGERA	CEL						X			X
SPHAEROCYSTIS SCHROETERI	COL							1	1.1	41
STEPHANODISCUS	CEL						X			
STEPHANODISCUS ASTRAEA V. MINUTULA	CEL	15	5.1	373						
TOTAL				7289			5585			3773

LAKE NAME: FLAMING GORGE RES.
STORET NUMBER: 5605

NYGAARD TROPHIC STATE INDICES

DATE	05 15 75	08 07 75	09 22 75
MYXOPHYCEAN	01/0 E	04/0 E	05/0 E
CHLOROPHYCEAN	0/0 O	05/0 E	05/0 E
EUGLENOPHYTE	0/01 ?	0/09 ?	0/10 ?
DIATOM	0,10 ?	0,40 E	0,12 ?
COMPOUND	02/0 E	11/0 E	11/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 15 75	08 07 75	09 22 75
GENUS	00	03	05
SPECIES	00	03	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 15 75	08 07 75	09 22 75
AVERAGE DIVERSITY	H	1.81	2.59	1.93
NUMBER OF TAXA	S	15.00	22.00	26.00
NUMBER OF SAMPLES COMPOSITED	M	9.00	8.00	9.00
MAXIMUM DIVERSITY	MAXH	3.91	4.46	4.70
MINIMUM DIVERSITY	MINH	0.06	0.08	0.13
TOTAL DIVERSITY	D	6000.15	9484.58	4788.33
TOTAL NUMBER OF INDIVIDUALS/ML	N	3315.00	3662.00	2481.00
EVENNESS COMPONENT	J	0.46	0.58	0.41
RELATIVE EVENNESS	RJ	0.46	0.58	0.40
MEAN NUMBER OF INDIVIDUALS/TAXA	L	221.00	166.45	95.42
NUMBER/ML OF MOST ABUNDANT TAXON	K	1981.00	1331.00	1086.00

LAKE NAME: FLAMING GORGE RES. CONTINUED
STORET NUMBER: 8605

TAXA	FORM	05 15 75			08 07 75			09 22 75		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
ANABAENA	FIL									X
ANABAENOPSIS	FIL						X			
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL					2.6	95			X
APHANIZOMENON FLOS-AQUAE	FIL				11	26.0	951	11	43.8	1086
APHANOTHECE	COL					1.3	48			
APHANOTHECE CLATHRATA	COL									X
ASTERIONELLA FORMOSA	CEL			X		1.3	48			X
CERATIUM HIRUNDINELLA	CEL						X			X
CHROOCOCCUS LIMNETICUS	COL									X
CHROOMONAS ?	CEL	15	7.0	258	15	36.3	1331	4	10.7	465
COCCONEIS PLACENTULA	CEL					2.6	95			
CRYPTOMONAS EROSA	CEL			X	13	9.1	333	13	6.3	155
CRYPTOMONAS MARSSONII	CEL							12	27.1	672
CYCLOTELLA	CEL									X
CYMBELLA	CEL						X			X
DIATOMA TENUE V. ELONGATUM	CEL	13	7.0	258						
DIATOMA VULGARE	CEL			X						X
DINOBRYON DIVERGENS	CEL						X			X
EPITHEMIA SOREX	CEL			X						X
FRAGILARIA CAPUCINA V. MESOLEPTA	CEL	14	9.1	301						
FRAGILARIA CROTONENSIS	CEL	12	14.3	474	12	11.7	438			X
GLENODINIUM	CEL						X			X
GLENODINIUM GYMNODINIUM V. BISCUTELLIFORME	CEL						X			
GYMNODINIUM	CEL			X						X
MELOSIRA GRANULATA	CEL				14	5.2	190			
NAVICULA	CEL			1.3	43					
NITZSCHIA	CEL									X
NITZSCHIA #1	CEL			X						X
NITZSCHIA VERMICULARIS	CEL									X
OOCYSTIS	CEL						X			X
OSCILLATORIA #1	FIL			X						
OSCILLATORIA #2	FIL					1.3	48	19	4.2	103
SCENEDESMUS	COL						X			
SCENEDESMUS DIMORPHUR ?	COL									X
SCHROEDERIA SETIGERA	CEL					2.6	95			
SPHAEROCYSTIS SCHROETERI	COL						X			X
STEPHANODIACUS	CEL						X			
STEPHANODIACUS #1	CEL	11	39.0	1961						
SURIRELLA OVATA	CEL			X						
SYNEDRA	CEL						X			
SYNEDRA ?	CEL									X
SYNEDRA ULNA	CEL			X						
TETRAEDRON MINIMUM V. SCROBICULATUM	CEL									X
TOTAL				3319			3662			2481

LAKE NAME: FREMONT LAKE
STORET NUMBER: 5606

NYGAARD TROPHIC STATE INDICES

DATE	08 28 75	10 17 75
MYXOPHYCEAN	0/0 O	01/0 E
CHLOROPHYCEAN	0/0 O	0/0 O
EUGLENOPHYTE	0/0 ?	0/01 ?
DIATOM	1,50 E	0/02 ?
COMPOUND	03/0 E	01/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 28 75	10 17 75
GENUS	04	04
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 28 75	10 17 75
AVERAGE DIVERSITY	H	0,56	1,20
NUMBER OF TAXA	S	8,00	7,00
NUMBER OF SAMPLES COMPOSITED	M	3,00	3,00
MAXIMUM DIVERSITY	MAXH	3,00	2,81
MINIMUM DIVERSITY	MINH	0,03	0,02
TOTAL DIVERSITY	D	2036,16	4996,80
TOTAL NUMBER OF INDIVIDUALS/ML	N	3636,00	4164,00
EVENNESS COMPONENT	J	0,19	0,43
RELATIVE EVENNESS	RJ	0,18	0,43
MEAN NUMBER OF INDIVIDUALS/TAXA	L	454,50	594,86
NUMBER/ML OF MOST ABUNDANT TAXON	K	3336,00	3181,00

LAKE NAME: FREMONT LAKE
STORET NUMBER: 5606

CONTINUED

TAXA	FORM	08 28 75			10 17 75		
		IA	%C	ALGAL UNITS PER ML	IA	%C	ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL						X
ASTERIONELLA FORMOSA	CEL	131	3.8	128	12	11.2	460
CHLAMYDOMONAS ?	CEL	11	91.7	3336	11	76.4	3101
CHROOMONAS ?	CEL			X	15	2.3	94
CHRYSOPHYTAN FLAGELLATE	CEL				13	6.7	281
CRYPTOMONAS EROSA	CEL						X
CYCLOTELLA	CEL			X			
DINOBRYON CYLINDRICUM	CEL	15	1.2	43			
MELOSIRA ITALICA	CEL			X			
RHIZOSOLENIA ERIENSIS	CEL	14	1.2	43			
TABELLARIA FENESTRATA	CEL	13	3.4	96	14	3.4	140
TOTAL				3636			4164

LAKE NAME: GLENDU RES.
STORET NUMBER: 5607

NYGAARD TROPHIC STATE INDICES

DATE	05 22 75	08 27 75
MYXOPHYCEAN	01/0 E	01/0 E
CHLOROPHYCEAN	03/0 E	04/0 E
EUGLENOPHYTE	0/04 ?	0/05 ?
DIATOM	0,12 ?	0,08 ?
COMPOUND	04/0 E	06/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 22 75	08 27 75
GENUS	03	03
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 22 75	08 27 75
AVERAGE DIVERSITY	H	2,30	0,74
NUMBER OF TAXA	S	16,00	19,00
NUMBER OF SAMPLES COMPOSITED	M	5,00	3,00
MAXIMUM DIVERSITY	MAXH	4,00	4,25
MINIMUM DIVERSITY	MINH	0,10	0,08
TOTAL DIVERSITY	D	4048,00	2030,56
TOTAL NUMBER OF INDIVIDUALS/ML	N	1760,00	2744,00
EVENNESS COMPONENT	J	0,58	0,17
RELATIVE EVENNESS	RJ	0,57	0,16
MEAN NUMBER OF INDIVIDUALS/TAXA	L	110,00	144,42
NUMBER/ML OF MOST ABUNDANT TAXON	K	645,00	2407,00

LAKE NAME: GLENDO RES.
STORET NUMBER: 5807

CONTINUED

TAXA	FORM	08 22 75 IB	08 22 75 QC	08 22 75 ALGAL UNITS PER ML	08 27 75 IB	08 27 75 QC	08 27 75 ALGAL UNITS PER ML
ACHNANTHES	CEL						X
AMPHISTROPHUS FALCATUS	CEL						X
APHANIZOMENON FLOS-AQUAE	FIL				11	87.71	2407
ASTERIONELLA FORMOSA	CEL	14	10.01	176			X
CALONEIS AMPHISBAENA	CEL						X
CHROOMONAS ?	CEL		3.41	59			
COCCONEIS PLACENTULA	CEL						X
CRYPTOMONAS MARSSONII	CEL	13	16.61	293			
CYMATOPLEURA SOLEA	CEL			X			X
CYMBELLA 01	CEL						X
DACTYLOCOCCOPSIS	CEL		3.41	59			
DIATOMA TENUE V. ELONGATUM	CEL	11	36.61	645			
DIATOMA VULGARE	CEL			X	13	1.71	48
FRAGILARIA CROTONENSIS	CEL						X
FRAGILARIA LEPTOSTAURON	CEL			X			
GLENODINIUM ?	CEL			X			
MELOSIRA ITALICA	CEL						X
NAVICULA 02	CEL						X
NAVICULA TRIPUNCTATA	CEL	15	3.41	59	13	7.01	193
NITZSCHIA VERMICULARIS	CEL						X
PEDIASTRUM BORYANUM	COL						X
RHOICOSPHENIA CURVATA	CEL			X.	14	1.71	48
SCENEDESMUS	COL				15	1.71	48
SCENEDESMUS BICAUDATUS	COL			X			
SCENEDESMUS DIMORPHUS	COL			X			
SCENEDESMUS QUADRICAUDA V. LONGISPINA	COL			X			
SPHAEROCYSTIS SCHROETERI	COL						X
STEPHANODISCUS	CEL	13	26.61	469			
SURIRELLA	CEL						X
SYNEDRA ULNA	CEL			X			
TOTAL				1760			2744

LAKE NAME: KEY HOLE RES.
STORET NUMBER: 5608

NYGAARD TROPHIC STATE INDICES

DATE	05 23 75	08 29 75	10 15 75
MYXOPHYCEAN	1,00 E	3,00 E	03/0 E
CHLOROPHYCEAN	4,00 E	2,00 E	05/0 E
EUGLENOPHYTE	0/05 ?	0/05 ?	0,12 ?
DIATON	1,00 E	01/0 E	1,00 E
COMPOUND	6,00 E	6,00 E	10/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 23 75	08 29 75	10 15 75
GENUS	02	00	00
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 23 75	08 29 75	10 15 75
AVERAGE DIVERSITY	H	2,08	2,15	2,06
NUMBER OF TAXA	S	13,00	9,00	13,00
NUMBER OF SAMPLES COMPOSITED	M	4,00	4,00	4,00
MAXIMUM DIVERSITY	MAXH	3,70	3,17	3,70
MINIMUM DIVERSITY	MINH	0,06	0,08	0,05
TOTAL DIVERSITY	D	5237,44	2541,30	6303,60
TOTAL NUMBER OF INDIVIDUALS/ML	N	2518,00	1182,00	3060,00
EVENNESS COMPONENT	J	0,56	0,68	0,56
RELATIVE EVENNESS	RJ	0,56	0,67	0,56
MEAN NUMBER OF INDIVIDUALS/TAXA	L	193,69	131,33	235,38
NUMBER/ML OF MOST ABUNDANT TAXON	K	858,00	452,00	1356,00

LAKE NAME: KEY HOLE RES. CONTINUED
STORET NUMBER: 5608

TAXA	FORM	05 23 75			08 29 75			10 15 75		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
ANABAENA	FIL									X
ANKISTRODESMUS FALCATUS	CEL	3	3,3	83						
APHANIZOMENON FLOS-AQUAE	FIL				11	39,2	452	11	44,3	1356
ASTERIONELLA FORMOSA	CEL	12	34,1	858						X
BOTRYOCOCCUS BRAUNII	COL			X						
CHROOCOCCUS	COL						X			
CHROOMONAS ?	CEL			X	14	23,5	278	13	25,0	765
CHROOMONAS ? SPP.	CEL	19	28,6	719						
CLOSTERIUM	CEL				15	3,0	35			
COELASTRUM MICROPORUM	COL									X
COELOSPHAERIUM	COL			X						
COELOSPHAERIUM NAEGELIANUM	COL									X
CRUCIGENIA QUADRATA	COL							1	2,3	70
CRYPTOMONAS	CEL	14	3,3	83						
CRYPTOMONAS EROSA	CEL				13	20,6	243			
CRYPTOMONAS MARSSONII	CEL	11	27,5	692				12	11,4	348
DICTYOSPHAERIUM	COL									X
GLENODINIUM	CEL	1	1,1	28						
GOMPHOSPHAERIA APONINA	COL				12	11,8	139			
OOCYSTIS	CEL							14	13,6	417
OOCYSTIS PUSILLA	COL				1	3,0	35			
PHACUS CAUDATUS V. MINOR	CEL									X
SCENEDESMUS QUADRICAUDA	COL			X						
SCHROEDERIA SETIGERA	CEL						X			X
STAURASTRUM	CEL			X						
STEPHANODISCUS	CEL	19	2,2	55	1		X	15	3,4	104
TETRASTRUM	COL	1		X	1			1		
TOTAL				2519			1182			3060

LAKE NAME: OCEAN LAKE
STORET NUMBER: 5609

NYGAARD TROPHIC STATE INDICES

DATE	05 19 75	09 02 75	10 16 75
MYXOPHYCEAN	01/0 E	4,00 E	2,00 E
CHLOROPHYCEAN	04/0 E	5,00 E	10,0 E
EUGLENOPHYTE	0/05 ?	0/09 ?	0/12 ?
DIATOM	0/07 ?	0/04 ?	0/04 ?
COMPOUND	05/0 E	9,00 E	12,0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 19 75	09 02 75	10 16 75
GENUS	08	04	06
SPECIES	00	00	03

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 19 75	09 02 75	10 16 75
AVERAGE DIVERSITY	H	2,50	2,00	2,43
NUMBER OF TAXA	S	16,00	18,00	23,00
NUMBER OF SAMPLES COMPOSITED	N	1,00	1,00	1,00
MAXIMUM DIVERSITY	MAXH	4,00	4,17	4,52
MINIMUM DIVERSITY	MINH	0,10	0,13	0,05
TOTAL DIVERSITY	D	4410,00	3102,00	16470,54
TOTAL NUMBER OF INDIVIDUALS/ML	N	1764,00	1551,00	6778,00
EVENNESS COMPONENT	J	0,63	0,48	0,54
RELATIVE EVENNESS	RJ	0,62	0,47	0,54
MEAN NUMBER OF INDIVIDUALS/TAXA	L	110,25	86,17	294,70
NUMBER/ML OF MOST ABUNDANT TAXON	K	824,00	609,00	1891,00

LAKE NAME: OCEAN LAKE
STORET NUMBER: 5609

CONTINUED

TAXA	FORM	05 19 75			09 02 75			10 16 75		
		18	9C	ALGAL UNITS PER ML	18	9C	ALGAL UNITS PER ML	18	9C	ALGAL UNITS PER ML
ANABAENA	FIL				151	1.9	30			
ANKISTRODESMUS	CEL			X				151	4.3	291
ANKISTRODESMUS FALCATUS	CEL					1.9	30		0.9	58
APHANIZOMENON FLOS-AQUAE	FIL				12	11.8	183			
ASTERIONELLA FORMOSA	CEL			X			X	12	27.0	1833
CHLOROGONIUM	CEL	15	4.4	78				13	27.9	1891
CHLOROPHYTAN FILAMENT	FIL							14	18.0	1222
CHROOMONAS ?	CEL									X
CLOSTERIUM	COL									
COCCONEIS PLACENTULA	CEL			X						X
COELOSPHAERIUM	COL					1.9	30			
COSMARIUM	CEL						X			
CRUCIGENIA TETRAPEDIA	COL								0.4	29
CRYPTOMONAS EROSA	CEL	13	0.9	157						
CRYPTOMONAS MARSSONII	CEL	11	46.7	924			X			X
CRYPTOMONAS REFLEXA	CEL						X			X
CRYPTOMONAS SPP.	CEL				11	37.3	878	11	19.5	1251
CYMATOPLEURA SOLEA	CEL									X
CYMBELLA	CEL			X						
CYMBELLA MUELLERI									0.4	29
V. VENTRICOSA	CEL								0.4	29
DINOBRYON DIVERGENS	CEL						X			
EPITHEMIA	CEL						X			X
FRAGILARIA CROTONENSIS										
GLENODINIUM GYMNODINIUM	CEL			X			X			
V. BISCUTELLIFORME	COL						X			
MERISMOPEDIA MINIMA	CEL			X						
NAVICULA 01	CEL			X						
NAVICULA 02	CEL		0.9	157						X
NITZSCHIA	CEL		4.4	78	13	39.3	609			
OOCYSTIS	FIL		4.4	78						X
OSCILLATORIA	COL						X			X
PEDIASTRUM BORYANUM										
PEDIASTRUM DUPLEX	COL						X			X
V. CLATHRATUM	CEL								0.9	58
PLEUROSIGMA	COL				14	5.9	91			
SCENEDESMUS BIJUGA	COL		2.2	39					0.4	29
SCENEDESMUS QUADRICAUDA	CEL	14	6.7	118						
SCHROEDERIA SETIGERA	CEL	12	13.3	235					0.4	29
TABELLARIA	CEL									
TETRAEDRON CAUDATUM										X
TETRAEDRON MINIMUM	CEL						X		0.4	29
V. SCROBICULATUM	COL									
TETRASTRUM STAUROGENIAEFORME										
TOTAL				1764			1891			6778

LAKE NAME: SEMINOE RES.
STORET NUMBER: 5610

NYGAARD TROPHIC STATE INDICES

DATE	05 19 75	08 27 75	10 16 75
MYXOPHYCEAN	0/01 O	02/0 E	01/0 E
CHLOROPHYCEAN	1.00 E	0/0 O	01/0 E
EUGLENOPHYTE	1.00 E	0/02 ?	0/02 ?
DIATOM	0.06 ?	0/07 ?	0/01 ?
COMPOUND	3.00 E	02/0 E	02/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 19 75	08 27 75	10 16 75
GENUS	03	00	00
SPECIES	03	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 19 75	08 27 75	10 16 75
AVERAGE DIVERSITY	H	2.47	1.19	1.00
NUMBER OF TAXA	S	25.00	11.00	4.00
NUMBER OF SAMPLES COMPOSITED	M	5.00	5.00	5.00
MAXIMUM DIVERSITY	MAXH	4.64	3.46	2.00
MINIMUM DIVERSITY	MINH	0.37	0.13	0.03
TOTAL DIVERSITY	D	1731.47	1042.44	1070.00
TOTAL NUMBER OF INDIVIDUALS/ML	N	701.00	876.00	1070.00
EVENNESS COMPONENT	J	0.53	0.34	0.50
RELATIVE EVENNESS	RJ	0.50	0.32	0.50
MEAN NUMBER OF INDIVIDUALS/TAXA	L	28.04	79.64	267.50
NUMBER/ML OF MOST ABUNDANT TAXON	K	306.00	676.00	558.00

LAKE NAME: SEMINOE RES.
STORET NUMBER: 5610

CONTINUED

TAXA	FORM	05 19 75			08 27 75			10 16 75		
		IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML	IB	%C	ALGAL UNITS PER ML
ANABAENA	FIL						X			
APHANIZOMENON FLOS-AQUAE	FIL				11	77.2	676	11	47.9	512
ASTERIONELLA FORMOSA	CEL				4	2.9	25			
CALONEIS AMPHISBAENA	CEL			X						
CENTRIC DIATOM	CEL	1	9.4	66						
CHROOMONAS ?	CEL	12	43.7	306	1	0.6	75	12	52.1	558
COCCONEIS	CEL			X						
COSMARIUM	CEL			X						
CRYPTOMONAS EROSA	CEL				2	0.6	75			
CYMATOPLEURA SOLEA	CEL			X						
CYMBELLA	CEL			X						
DIATOMA VULGARE	CEL			X			X			
EPITHEMIA SOREX	CEL	4	8.3	44	1	2.9	25			
EUGLENA	CEL			X						
FRAGILARIA CROTONENSIS	CEL						X			
GLENODINIUM	CEL			X						
GOMPHONEMA OLIVACEUM	CEL	11	15.8	109						
GOMPHONEMA TRUNCATUM	CEL			X						
GOMPHONEMA VENTRICOSUM ?	CEL			X						
GYROSIGMA	CEL			X						
HANNAEA ARCUS	CEL	1	3.1	22						
NAVICULA #1	CEL			X						
NAVICULA #2	CEL						X			
NAVICULA SALINARUM V. INTERMEDIA	CEL			X						
NITZSCHIA	CEL						X			
NITZSCHIA VERMICULARIS	CEL			X						
PENNATE DIATOM	CEL	1	9.4	66						
PINNULARIA	CEL			X			X			
RHOICOSPHENIA CURVATA	CEL			X						
SCENEDESMUS QUADRICAUDA	COL	1	3.1	22						
SPHAEROCYSTIS SCHROETERI	COL									X
SURIRELLA OVATA	CEL			X						X
SYNEDRA ULNA	CEL	1	9.4	66						
TOTAL				781			876			1070

LAKE NAME: SODA LAKE
STORET NUMBER: 5611

NYGAARD TROPHIC STATE INDICES

DATE	08 28 75	10 20 75
MYXOPHYCEAN	02/0 E	0/0 O
CHLOROPHYCEAN	02/0 E	01/0 E
EUGLENOPHYTE	0/04 ?	0/01 ?
DIATOM	0/05 ?	0/02 ?
COMPOUND	04/0 E	01/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 28 75	10 20 75
GENUS	00	00
SPECIES	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 28 75	10 20 75
AVERAGE DIVERSITY	H	1,11	1,58
NUMBER OF TAXA	S	9,00	3,00
NUMBER OF SAMPLES COMPOSITED	M	2,00	2,00
MAXIMUM DIVERSITY	MAXH	3,17	1,58
MINIMUM DIVERSITY	MINH	0,24	0,13
TOTAL DIVERSITY	D	358,53	0,00
TOTAL NUMBER OF INDIVIDUALS/ML	N	323,00	0,00
EVENNESS COMPONENT	J	0,35	1,00
RELATIVE EVENNESS	RJ	0,30	0,32
MEAN NUMBER OF INDIVIDUALS/TAXA	L	35,89	0,00
NUMBER/ML OF MOST ABUNDANT TAXON	K	221,00	0,01

LAKE NAME: SODA LAKE CONTINUED
STORET NUMBER: 5611

TAXA	FORM	09 20 75 IB	09 20 75 %C	09 20 75 ALGAL UNITS PER ML	10 20 75 IB	10 20 75 %C	10 20 75 ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL	3	0,3	17			
CAMPYLODISCUS	CEL						X
COCCONEIS PEDICULUS	CEL			X			
CYANOPHYTAN COCCOID CELLED COLONY	COL	11	69,4	221			
CYMBELLA	CEL			X			
DIATOMA VULGARE	CEL			X			
KLARATOTHRIX	COL	12	26,3	85			
FRAGILARIA	CEL			X			
NAVICULA	CEL			X			X
OOCYSTIS	CEL			X			
PEDIASTRUM BORYANUM	COL						X
TOTAL				323			0

LAKE NAME: VIVA NAUGHTON RES.
STORET NUMBER: 5612

NYGAARD TROPHIC STATE INDICES

DATE	08 06 75	09 18 75	10 16 75
MYXOPHYCEAN	02/0 E	01/0 E	01/0 E
CHLOROPHYCEAN	01/0 E	01/0 E	0/0 O
EUGLENOPHYTE	0/03 ?	0/02 ?	0/01 ?
DIATOM	0/01 ?	0/03 ?	01/0 E
COMPOUND	03/0 E	02/0 E	02/0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	08 06 75	09 18 75	10 16 75
GENUS	01	00	00
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		08 06 75	09 18 75	10 16 75
AVERAGE DIVERSITY	H	1,06	0,08	0,81
NUMBER OF TAXA	S	8,00	5,00	5,00
NUMBER OF SAMPLES COMPOSITED	M	3,00	3,00	3,00
MAXIMUM DIVERSITY	MAXH	3,00	2,32	2,32
MINIMUM DIVERSITY	MINH	0,02	0,01	0,02
TOTAL DIVERSITY	D	5676,30	329,12	2007,18
TOTAL NUMBER OF INDIVIDUALS/ML	N	5355,00	4114,00	2478,00
EVENNESS COMPONENT	J	0,35	0,03	0,35
RELATIVE EVENNESS	RJ	0,35	0,04	0,35
MEAN NUMBER OF INDIVIDUALS/TAXA	L	669,38	822,80	495,60
NUMBER/ML OF MOST ABUNDANT TAXON	K	4430,00	4073,00	2135,00

LAKE NAME: VIVA NAUGHTON RES.
STORET NUMBER: 5612

CONTINUED

TAXA	FORM	08 06 75			09 10 75			10 16 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
APHANIZOMENON FLOS-AQUAE	FIL	11	82,7	4430	11	99,0	4073	11	86,2	2135
CERATIUM HIRUNDINELLA F. ROBUSTUM	CEL	14	0,9	49						
CHROOMONAS ?	CEL	1	5,5	292				19	6,9	172
CRYPTOMONAS #1	CEL							13	4,2	103
CRYPTOMONAS EROSA	CEL	13	2,7	146						
CRYPTOMONAS MARSSONII	CEL							14	1,4	34
CRYPTOMONAS REFLEXA	CEL	13	2,7	146						
EUNOTIA	CEL			X						
FRAGILARIA CROTONENSIS	CEL						X			
GOMPHONEMA	CEL						X			
MICROCYSTIS INCERTA	COL	19	4,5	243						
NAVICULA	CEL						X			
SCHROEDERIA SETIGERA	CEL	1	0,9	49	12	1,0	41			
STEPHANODISCUS	CEL							13	1,4	34
TOTAL				5355			4114			2478

LAKE NAME: WOODRUFF NARROWS RES.
STORET NUMBER: 5613

NYGAARD TROPHIC STATE INDICES

DATE	05 16 75	08 07 75	09 18 75	10 16 75
MYXOPHYCEAN	0/0 D	02/0 E	03/0 E	1.00 E
CHLOROPHYCEAN	02/0 E	03/0 E	03/0 E	1.50 E
EUGLENOPHYTE	0.50 E	0.20 ?	0.17 ?	0/05 ?
DIATOM	0.20 ?	01/0 E	2.00 E	0.67 E
COMPOUND	04/0 E	07/0 E	09/0 E	3.50 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 16 75	08 07 75	09 18 75	10 16 75
GENUS	00	00	01	00
SPECIES	00	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 16 75	08 07 75	09 18 75	10 16 75
AVERAGE DIVERSITY	H	1.17	2.04	1.76	2.04
NUMBER OF TAXA	S	14.00	10.00	14.00	16.00
NUMBER OF SAMPLES COMPOSITED	M	2.00	2.00	2.00	2.00
MAXIMUM DIVERSITY	MAXH	3.81	3.32	3.81	4.00
MINIMUM DIVERSITY	MINH	0.02	0.07	0.07	0.29
TOTAL DIVERSITY	D	11879.01	2955.96	3954.72	1087.32
TOTAL NUMBER OF INDIVIDUALS/ML	N	10153.00	1449.00	2247.00	533.00
EVENNESS COMPONENT	J	0.31	0.61	0.46	0.51
RELATIVE EVENNESS	RJ	0.31	0.61	0.46	0.48
MEAN NUMBER OF INDIVIDUALS/TAXA	L	725.21	144.90	160.50	33.31
NUMBER/ML OF MOST ABUNDANT TAXON	K	7723.00	676.00	1103.00	205.00

LAKE NAME: WOODRUFF NARROWS RES. CONTINUED
STORET NUMBER: 5613

TAXA	FORM	08 16 75			08 07 75			09 18 75			10 16 75		
		IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML	IS	%C	ALGAL UNITS PER ML
ANABAENA	FIL				11	6,7	97						
ANABAENA 01	FIL							14	1,9	41			
ANABAENA FLOS-AQUAE	FIL							11	49,1	1103			
ANKISTRODESMUS FALCATUS	CEL												X
APHANIZOMENON FLOS-AQUAE	FIL							13	14,4	327	11	38,9	205
ASTERIONELLA FORMOSA	CEL	1	0,9	54									
CENTRIC DIATOM	CEL	14	9,0	810									
CERATIUM HIRUNDINELLA	CEL									X			
CHROOMONAS ?	CEL	13	13,9	1296	19	10,0	145			X	14	7,7	41
CLOSTERIUM	COL												X
COSMARIUM	CEL												X
CRYPTOMONAS	CEL									X			
CRYPTOMONAS EROSA	CEL				14	6,7	97						X
CRYPTOMONAS MARSSONII	CEL	13	2,1	216									
CRYPTOMONAS REFLEXA	CEL						X				13	15,4	82
CYANOPHYTAN COLONY	COL												X
DIATOMA TENUE V. ELONGATUM	CEL			X									
EUDORINA ELEGANS	COL									X			X
EUGLENA	CEL			X		3,3	48			X			
FLAGELLATE	CEL	11	76,1	7723									
FRAGILARIA CROTONENSIS	CEL									X			
GLENODINIUM EDAX ?	CEL			X									
HANTZSCHIA	CEL			X									
MELOSIRA GRANULATA	CEL						X	15	5,4	122			
MELOSIRA ITALICA	CEL												X
MERISMOPEDIA MINIMA	COL				13	46,7	676						
NAVICULA	CEL												X
OOCYSTIS	CEL						X			X			X
PASCHERINA TETRAS	COL			X									
PEDIASTRUM BORYANUM	COL			X									
PEDIASTRUM DUPLEX V. CLATHRATUM	COL									X			
SCENEDESMUS BALATONICUS	COL									X			
SCENEDESMUS BIJUGA	COL						X						
SCENEDESMUS QUADRICAUDA	COL			X									
SCHROEDERIA SETIGERA	CEL				12	26,6	384				15	7,7	41
STEPHANODISCUS	CEL							12	29,1	654	13	30,9	164
SURIRELLA	CEL	15	0,9	54									X
SYNEDRA ULNA	CEL			X									X
TOTAL				10153			1449			2247			533

LAKE NAME: YELLOWTAIL RES.
STORET NUMBER: 5614

NYGAARD TROPHIC STATE INDICES

DATE	05 21 75	08 29 75	10 17 75
MYXOPHYCEAN	01/0 E	3.00 E	2.00 E
CHLOROPHYCEAN	0/0 O	3.00 E	3.00 E
EUGLENOPHYTE	0/01 ?	0/06 ?	0.20 ?
DIATOM	0.25 ?	0.50 E	0.33 E
COMPOUND	04/0 E	9.00 E	10.0 E

PALMER'S ORGANIC POLLUTION INDICES

DATE	05 21 75	08 29 75	10 17 75
GENUS	04	01	08
SPECIES	00	00	00

SPECIES DIVERSITY AND ABUNDANCE INDICES

DATE		05 21 75	08 29 75	10 17 75
AVERAGE DIVERSITY	H	3.09	1.97	2.64
NUMBER OF TAXA	S	17.00	21.00	26.00
NUMBER OF SAMPLES COMPOSITED	N	7.00	7.00	9.00
MAXIMUM DIVERSITY	MAXH	4.09	4.39	4.70
MINIMUM DIVERSITY	MINH	0.13	0.09	0.34
TOTAL DIVERSITY	D	4554.66	5460.84	2180.64
TOTAL NUMBER OF INDIVIDUALS/ML	N	1474.00	2772.00	826.00
EVENNESS COMPONENT	J	0.76	0.45	0.56
RELATIVE EVENNESS	RJ	0.75	0.44	0.53
MEAN NUMBER OF INDIVIDUALS/TAXA	L	86.71	132.00	31.77
NUMBER/ML OF MOST ABUNDANT TAXON	K	357.00	1728.00	363.00

LAKE NAME: YELLOWTAIL RES.
STORET NUMBER: 5614

CONTINUED

TAXA	FORM	05 21 75			08 30 75			10 17 75		
		1S	%C	ALGAL UNITS PER ML	1S	%C	ALGAL UNITS PER ML	1S	%C	ALGAL UNITS PER ML
ANABAENA	FIL				5	1.4	40			
ANKISTRODESMUS FALCATUS V. ACICULARIS	CEL									
APHANIZOMENON FLOS-AQUAE	FIL									
ASTERIONELLA FORMOSA	CEL	12	15.1	223	11	62.3	1728			X
CARTERIA	CEL									X
CHLOROGONIUM	CEL				12	7.3	201			X
CHROOMONAS ?	CEL						X			
CLOSTERIUM	COL					7.3	201			
COCCONEIS PEDICULUS	CEL						X		43.9	363
COELASTRUM MICROPORUM	COL			X						
CRYPTOMONAS	CEL		6.0	89			X			
CRYPTOMONAS EROSA	CEL									
CRYPTOMONAS MARSSONII	CEL				4	2.9	80		4.8	40
CRYPTOMONAS REFLEXA	CEL					1.4	40			
CYMBELLA MINUTA	CEL									X
CYMBELLA VENTRICOSA	CEL		3.1	46					2.4	20
CYST	CEL								2.4	20
DIATOMA VULGARE	CEL	13	6.0	89		1.4	40			
DINOBRYON DIVERGENS	CEL						X			X
EPITHEMIA SOREX	CEL			X						
EUGLENA	CEL						X			X
FRAGILARIA CROTONENSIS	CEL									
GOMPHONEMA OLIVACEUM	CEL	11	24.2	357						
LYNGBYA	CEL		3.1	45			X			X
MELOSIRA	FIL	9	9.1	134						X
MELOSIRA DISTANS	CEL									
MELOSIRA GRANULATA	CEL									
MELOSIRA GRANULATA V. ANGUSTISSIMA	CEL			X			X			X
MELOSIRA ITALICA	CEL									
MICROCYSTIS INCERTA	CEL	14	18.2	268						X
NAVICULA	COL									
NAVICULA CUSPIDATA V. AMBIGUA	CEL		9.1	134	13	7.3	201			
NAVICULA RHYNCHOCEPHALA V. GERMAINII	CEL			X						
NAVICULA TRIPUNCTATA	CEL									
NITZSCHIA	CEL									
NITZSCHIA #1	CEL								13.2	101
NITZSCHIA #2	CEL			X					7.3	40
NITZSCHIA FILIFORMIS ?	CEL								9.0	91
NITZSCHIA LONGISSIMA V. REVERSA	CEL						X			
			3.1	45			X			
NITZSCHIA VERMICULARIS	CEL									
ODCYSTIS	CEL									
OSCILLATORIA	CEL									X
RHODOMONAS ?	FIL						X			X
RHOPALODIA GIBBA	CEL									
SCENEDESMUS	CEL						X		4.0	40
SCHROEDERIA SETIGERA	COL			X						
SKELETONEMA POTAMOS	CEL									
SPHAEROCYSTIS SCHROETERI	CEL						X			X
STAURASTRUM	COL				8.7		241			
STEPHANODISCUS	CEL									
SYNEDRA	CEL		3.1	45					2.4	20
SYNEDRA ULNA	CEL									X
	CEL						X		9.0	91
TOTAL				1474			2772			826